

CLAIMS

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is as follows:

1 1. A mail edge biasing machine for sorting stacks of products in a
2 homogenous orientation, comprising:

3 a plurality of compartments;

4 a plurality of moveable plates associated with each of the plurality
5 of compartments; and

6 a stationary feed head mechanism positioned proximate a central
7 compartment of the plurality of compartments, the feed head mechanism
8 being capable of transporting the products from the central compartment
9 to remaining compartments of the plurality of compartments,

10 wherein the feed head mechanism allows arrangement of products
11 transported to the remaining compartments to be each stacked proximate
12 the moveable plates and oriented with bound edges in the homogenous
13 orientation.

1 2. The mail edge biasing machine of claim 1, wherein the feed
2 head mechanism separately transports each of the products from the
3 central compartment to the remaining compartments.

1 3. The mail edge biasing machine of claim 1, wherein the central
2 moveable plate supports the products which have bound edges oriented in
3 opposing directions.

1 4. The mail edge biasing machine of claim 1, wherein the plurality
2 of compartments includes the central compartment and opposing side
3 compartments.

1 5. The mail edge biasing machine of claim 1, wherein the feed
2 head mechanism comprises:
3 a belt driven transportation mechanism having a plurality of
4 suction ports; and
5 a vacuum source in communication with the plurality of suction
6 ports.

1 6. The mail edge biasing machine of claim 5, wherein the belt
2 driven transportation mechanism is three belt driven transportation
3 mechanisms adapted to transport the stack of products in opposing
4 directions from the central compartment to the remaining compartments
5 which are opposing side compartments.

1 7. The mail edge biasing machine of claim 6, wherein the vacuum
2 source, via the plurality of suction ports, moves a product of the stack of
3 products from the central compartment for transportation to either of the
4 opposing side compartments.

1 8. The mail edge biasing machine of claim 1, further comprising
2 moveable walls separating each of the plurality of compartments.

1 9. The mail edge biasing machine of claim 1, further comprising a
2 plurality of belt drives for incrementally moving the plurality of moveable
3 plates and the stacks of products.

1 10. The mail edge biasing machine of claim 1, further
2 comprising a plurality of bottom elevator type moving systems for
3 incrementally moving the plurality of moveable plates and the stacks of
4 products, and which allows tops of the stacks of products to remain in a
5 fixed plane relative to the feed head mechanism.

1 11. The mail edge biasing machine of claim 1, wherein the feed
2 head mechanism includes an optical edge recognition system for detecting
3 a bound edge of the product.

1 12. The mail edge biasing machine of claim 11, wherein
2 information received from the optical edge recognition system is used for
3 separately transporting products of the stack of products from the central
4 compartment to the remaining compartments which are opposing side
5 compartments, thereby orienting the stack of products on each of the
6 opposing side compartments with bound edges in the homogenous
7 orientation.

1 13. A mail edge biasing system, comprising:
2 a general holding container divided into three separate
3 compartments;
4 opposing moveable guide walls separating the three separate
5 compartments;

6 moveable plates associated with each of the three separate
7 compartments, the moveable plates being adapted to move in either a first
8 direction or a second direction;

9 a feed head mechanism positioned over a central compartment of
10 the three separate compartments, the feed head mechanism including:

11 an optical edge recognition system for recognizing
12 differences in bound and non-bound edges of the products; and

13 a movement mechanism for moving products positioned
14 proximate a central moveable plate from the central compartment to
15 opposing side compartments of the three separate compartments based on
16 the recognition of the bound and non-bound edges of the products.

1 14. The mail edge biasing system of claim 12, wherein the
2 movement mechanism is two belt driven systems and each of the two belt
3 driven systems includes a plurality of suctioning ports for moving or
4 elevating the products positioned proximate the central moveable plate.

1 15. The mail edge biasing system of claim 14, wherein the two
2 belt driven systems are designed to move the products from the central
3 compartment to the opposing side compartments based on the information
4 received from the optical edge recognition system.

1 16. The mail edge biasing system of claim 13, further comprising
2 a belt driven system for moving the moveable plates, wherein a central
3 moveable plate is incrementally moveable towards the head feed
4 mechanism and opposing side moveable plates are incrementally
5 moveable away from the feed head mechanism.

1 17. A method of orienting a stack of products in a same direction,
2 comprising the steps of:
3 providing a stack of products in a central compartment;
4 incrementally moving the stack of products in the central
5 compartment towards a feed head mechanism;
6 detecting a difference between edges of a top product of the stack
7 of products; and
8 transporting the top product to one of two side compartments based
9 on the detecting step,
10 wherein all products transported to a first of the two side
11 compartments are oriented in a first same direction and all products
12 transported to a second of the two side compartments are oriented in a
13 second same direction.

1 18. The method of claim 17, further comprising repeating the
2 steps of claim 17 until the stack of products in the central compartment is
3 depleted.

1 19. The method of claim 17, wherein the product is elevated by
2 the feed head mechanism.

1 20. The method of claim 17, wherein the detecting step is based on a difference
2 in thickness between the edges to determine a bound edge and a non bound edge of the
3 top product.

- 1 21. The method of claim 17, wherein the transporting step includes elevating the
2 top product.

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